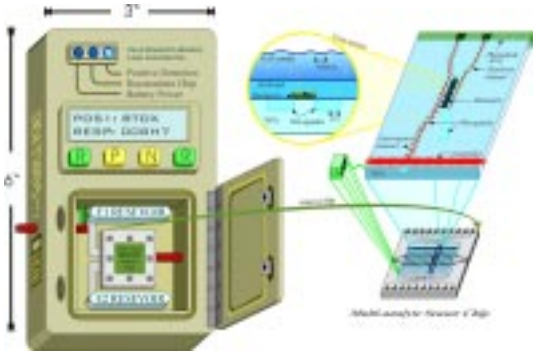
Naval Research Laboratory
Environmental Quality Sciences

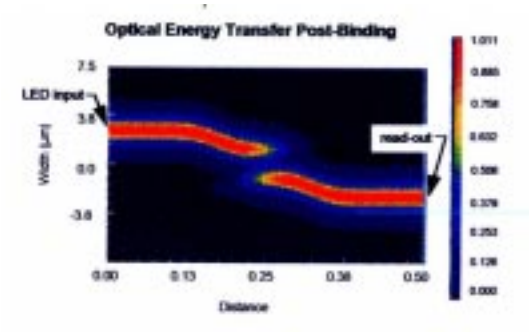
Environmental Quality Sciences
Chemistry Division
U.S. Naval Research Laboratory

Biological-Based Optical Waveguide Sensors

Biosensors are devices capable of qualitative and quantitative detection in real time (seconds to minutes). Biosensors typically recognize and detect the binding of biomolecules with either antibodies, nucleic acids, bacteria, cellular receptors, enzymes and whole cells as the detector analytes. Binding of biomolecules in the biosensor between the target analyte and the molecule detected produces a physical/chemical change that can be detected and measured by the sensor. The most widely used biosensors are those based on optical properties, which include fiber optic, surface plasmon resonance and optical waveguides.



Researchers at the Naval Research Laboratory, in collaboration with Loats Associates (Westminster, MD), are developing a unique biosensor capable of measuring the presence of more than 50 molecules and biological indicators. This device supports the DoD environmental security, medical, and CBW requirements.



The sensor has been miniaturized such that the detection device is approximately 1” x 3” and the reading device is a palm-sized unit. The sensor utilizes a number of recognition phenomena such as antibody-antigen, metal-binding protein-metal and lectin-sugar binding events

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